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REMARKS

Claims 25, 29-31, 33, 37-39, and 41-50 are pending, with claims 29, 37, and 45 being independent. Claims 45-50 have been amended. No new matter has been added. Reconsideration and allowance of the above-referenced application are respectfully requested.

Rejections Under 35 U.S.C. §112

Claims 45-50 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite. Without conceding the propriety of this rejection, claims 45-50 have been amended to obviate the rejection. Thus, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

Rejections Under 35 U.S.C. §103

Claims 25, 29-31, 33, 37-39, and 41-50 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Sawhney, H. E., et al., "Video Flashlights – Real Time Rendering of Multiple Videos for Immersive Model Visualization" (hereinafter "Sawhney"). This contention is respectfully traversed.

The substance of the rejections in the 6-13-2008 Office Action are essentially the same as that presented in the 11-13-2007 Office Action (aside from the repositioning of text in light of the prior amendments). Thus, the 3-13-2008 Response filed in this application is hereby incorporated by reference. In addition, the Office's responses to the prior arguments are addressed.

In the 3-13-2008 Response, it was noted that Sawhney does **not** described placing a surface that corresponds to the moving region in the three dimensional model and projecting

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real-time video imagery information onto the three dimensional model, **including the surface**.[1]

In response, the Office states[2]:

> In response to Applicant's argument (on page 9 in first paragraph) that the reference
> Sawhney does not state the video information is projected on to such models, Contrarily,
> Sawhney teaches clearly in fig. 8d, see model red lines. On pages 9-10, Applicant argues that
> Sawhney does not describe, placing a surface that corresponds to a moving region in a three
> dimensional model, Examiner believes Sawhney e.g., in fig. 9 illustrates a moving region (a
> moving aerial) in a 3-D model e.g., using model lines in fig. 8d.

However, Figure 8d in Sawhney shows model lines being projected on to the image using an

estimated pose of the camera, **not** projecting real-time video imagery information onto a three

dimensional model **including** a surface placed into the model to correspond to a moving region

identified in the real-time video imagery information.

Further, the reference to Figure 9 in Sawhney is not understood. Figure 9 in Sawhney

shows the rendering of two frames of a video captured from a moving aerial autonomous

helicopter. The suggestion by the Office the "moving aerial", which is the helicopter having a

camera that captures the video imagery, can somehow be equated with the moving region

identified within the video imagery itself completely defies common sense, and contradicts the

other stated bases for rejecting the claims. With all due respect to the Office, nothing in the cited

portions of Sawhney (or any other portion of Sawhney) teaches projecting real-time video

imagery information onto a surface that has been placed into a three dimensional model of a

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[1] *See* 3-13-2008 Response at page 9.
[2] *See* 6-13-2008 Office Action at page 2.

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three dimensional environment in order to correspond to a region in motion identified within that very same real-time video imagery information.

In addition, in the 3-13-2008 Response, in order to clearly distinguish over Sawhney, claim 29 was amended to recite, "wherein placing the surface comprises casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model, and determining a position, an orientation and a size of the surface based on the ray, a ground plane in the three dimensional model, and the moving region."[3] In the 6-13-2008 Office Action, the exact same "Examiner's note" has been copied from the old rejection of claim 26 to the new rejection of claim 29, but the argument made regarding this Examiner's note has not been addressed. As pointed out before, it should be noted that the ray casting claimed relates to casting a vector in the three dimensional model[4] and does not refer to generating pixels on a display. Since the current rejection fails to address this point, there is a clear legal or factual deficiency in the current rejection.

In the 3-13-2008 Response, it was also noted that nothing Figure 10 (of Sawhney) or its corresponding description says anything about determining a position, an orientation and a size of a surface that is placed in a three dimensional model, let alone "casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model." In fact, the only technique described in Sawhney for modeling a moving object is to use "stereo depth information" from

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[3] *See e.g.,* Specification at paragraphs 101-106.
[4] *See e.g.,* Specification at paragraph 104.

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"stereo cameras."[5] This is in sharp contrast with the presently claimed techniques, which can be

employed using only a single camera.[6] In response to this, the Office states[7]:

> In response to Applicant's argument on page 10 in second paragraph the reference's
>
> technique described a moving object uses stereo cameras, and this is in sharp contrast with the
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> claimed invention, which can be employed using a single camera. Examiner's reply: in light of
>
> the specification e.g. in fig. 10 illustrates at least three cameras.
>
>   Examiner's notes: Applicant my point out where is the limitation of using only a single
>
> camera in the claims?

First, the reference to FIG. 10 of the present specification is completely irrelevant since FIG. 10

of the present specification is not related to the claimed process of placing a surface into a three

dimensional model; rather FIG. 16 relates to this claimed subject matter. Thus, the Office

appears be defying well established law that the Office may not read limitations into the claims

from the specification.

Second, as to the actual language of the claim, it has not been argued that the claim

recites only using a single camera. Rather, the claim recite, "wherein placing the surface

comprises casting a ray from an optical center, corresponding to the real-time video imagery

information, to a bottom point of the moving region in an image plane in the three dimensional

model, and determining a position, an orientation and a size of the surface based on the ray, a

ground plane in the three dimensional model, and the moving region." The specific single

camera implementation (which is described in connection with FIG. 16 of the present

application) has been noted only to assist the Office in understanding the plain meaning of the

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[5] *See* Sawhney at sections 2 and 5, at pages 158 and 165.
[6] *See e.g.,* Specification at FIG. 16 and corresponding description.
[7] *See* 6-13-2008 Office Action at page 2.

claim language. Sawhney teaches the modeling of a moving object using stereo depth

information from stereo cameras, which does not in any way teach or suggest "placing a surface

that corresponds to the moving region in the three dimensional model, wherein placing the

surface comprises casting a ray from an optical center, corresponding to the real-time video

imagery information, to a bottom point of the moving region in an image plane in the three

dimensional model, and determining a position, an orientation and a size of the surface based on

the ray, a ground plane in the three dimensional model, and the moving region."

Thus, for at least the above reasons, independent claim 29 should be in condition for

allowance. Similar arguments are applicable to claims 37 and 45, and thus, independent claims

37 and 45 should each be in condition for allowance. Dependent claims 25, 30, 31, 33, 38, 39,

41-44 and 46-50 should be patentable based on their respective base claims and the additional

recitations they contain.

For example, claims 41, 43 and 49 each recite, "wherein identifying a foreground object

comprises identifying the foreground object in the subtracted real-time video imagery

information using a histogram-based threshold and a noise filter." As noted in the 3-13-2008

Response, the cited portion of Sawhney clearly describes the use of a threshold applied to a

difference image between a current image and a median of a stack of images.[8] Sawhney does not

indicate that the threshold is histogram-based or that a noise filter is used. In response, the

Office refers to page 164 and Sawhney's teaching that "the absolute value at each point can then

be computed, and the result can be thresholded in order to highlight intensity or feature

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[8] *See* Sawhney at Figure 10 and section 5, at page 164 and 167.

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differences between the current video image and the reference image[.]"[9] Thus, once again, the

Office has failed to explain how this teaching of Sawhney is considered to teach the use of a

histogram-based threshold.

Also noted in the 3-13-2008 Response was that fact that Sawhney does not indicate that a

noise filter is used in identifying a foreground object, and the Office's interpretation that "a noise

filter" may be considered "as a virtual camera view in fig. 3"[10] is not understood and is without

rational basis. In response, the Office refers to page 160 and Figure 3 of Sawhney, asserting that

such "clearly illustrates final rendered composite that has been filtered the video pixels."[11]

Again, this doesn't address the claimed subject matter, which requires the use of a noise filter in

the process of identifying a foreground object. Thus, for at least these additional reasons, there

are clear legal or factual deficiencies in the current rejection of claims 41, 43 and 49.

Claims 42, 44 and 50 each recite, "wherein identifying a region in motion in real time

further comprises estimating the background image by modeling the background image as a

temporal pixel average of five recent image frames in the real-time video imagery information."

With respect to this subject matter, the Office "takes an official notice for an average of five

recent frames, because Sawhney on page 161 under 'A pseudo-code for the rendering algorithm

..' teaches as one of the parameters that a user may be indicated a number for number of frames

'frame number', and that number may be 5 image frames."[12] This official notice is explicitly

challenged. The "Frame Number" is a parameter to the "UpdateVideoContent" procedure,

which clearly relates to retrieving the most recent available video data from a camera specified

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[9] *See* 6-13-2008 Office Action at pages 2-3.
[10] *See* 11-13-2007 Office Action at page 4.
[11] *See* 6-13-2008 Office Action at page 3.
[12] *See* 6-13-2008 Office Action at page 8.

by "Video Source". Contrary to the Office's assertion, nothing in Sawhney suggests that this

procedure is part of the process of moving object detection or that the "Frame Number" may be

an indication to use five recent image frames to generate a temporal pixel average to model the

background image.

Furthermore, taking official notice regarding this claimed subject matter is inappropriate

since the Office has previously contended that "applicant has established criticality for the use of

five frames in the averaging technique" and "optimizing such a number of frames would require

undue experimentation under *In re Wands*, since applicant points out that five frames has a

specific benefit, as per the specification."[13] In response to these points, the Office states[14]:

> wherein identifying a region in motion in real time further comprises estimating the background
>
> image by modeling the background image as a temporal pixel average of five recent image
>
> frames in the real-time video imagery information (e.g., on page 164 at right col. teaches the
>
> reference background image needs to be constantly updated during the day to reflect changing
>
> ambient illumination. Alternatively only moving objects may be detected by comparing current
>
> image with an image taken a few seconds before. The 2D moving object detection can be done in
>
> real time, also see page 162 left column at third paragraph). On the other hand, comparing fig. 15
>
> of the current invention with fig. 10 of the reference: in fig. 15 steps 1500, 1510, 1520, and 1530
>
> illustrate what is shown the left side of fig. 10, and fig. 10 illustrates the validated foreground
>
> object in step 1550 in the middle of fig. 10.

With all due respect to the Office, the undersigned attorney completely fails to understand how

this response actually addresses the arguments presented. Thus, there are clear legal or factual

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[13] *See* 11-28-2005 Office Action at page 6.
[14] *See* 6-12-2008 Office Action at page 3.

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deficiencies in the rejection of claims 42, 44 and 50, and these claims should be in condition for

allowance.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence

of a reply to a specific issue or comment does not signify agreement with or concession of that

issue or comment. Because the arguments made above may not be exhaustive, there may be

reasons for patentability of any or all pending claims (or other claims) that have not been

expressed. Finally, nothing in this paper should be construed as an intent to concede any issue

with regard to any claim, except as specifically stated in this paper.

It is respectfully suggested for all of these reasons, that the current rejections are

overcome, that none of the cited art teaches or suggests the features which are claimed, and

therefore that all of these claims should be in condition for allowance. A formal notice of

allowance is thus respectfully requested. In the absence of such, a telephone interview is

requested to review the claims and the cited art.

No fees are believed due with this response. Nonetheless, please apply any necessary

charges or credits, to deposit account 06-1050.

Respectfully submitted,

Date: _Sept. 15, 2008_

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